Chemistry of Fire

Chemistry of Fire

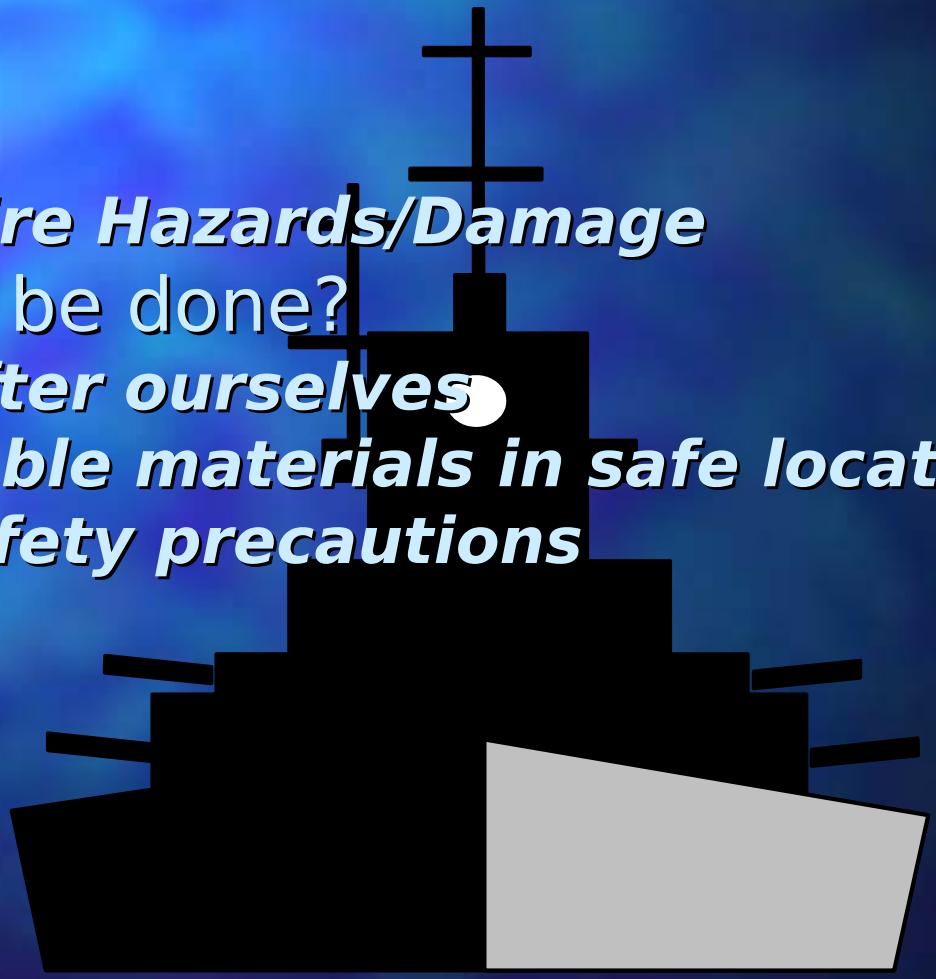
- Enabling Objectives:

Upon completion of this topic, the trainee will be able to:

1. State the purpose of shipboard fire prevention.
2. Describe the fire triangle.
3. Describe the methods for heat transfer.
4. Describe the characteristics of combustible materials and the classes of fires.

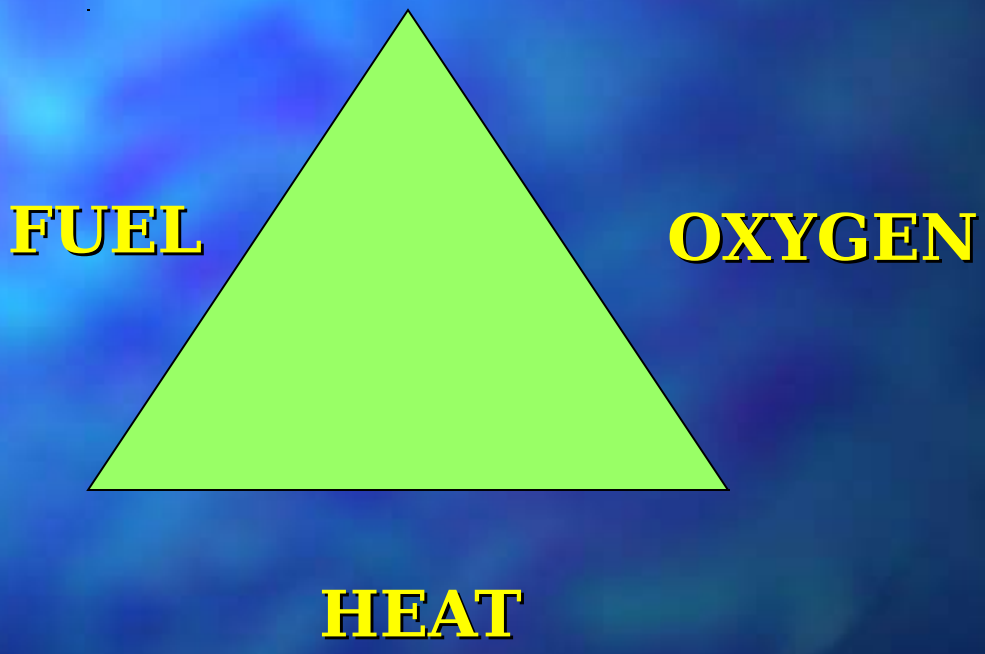
Chemistry of Fire

- Fire Prevention:
  - Purpose:
    - ***Minimize Fire Hazards/Damage***
  - How can this be done?
    - ***Clean up after ourselves***
    - ***Put flammable materials in safe locations***
    - ***Observe safety precautions***



Chemistry of Fire

- Fire Triangle:
  - 3 sides:



Chemistry of Fire

- Fuel:
  - Solids:
    - *Examples*
  - Liquids:
    - *Examples*
  - Flammable Gases:
    - *Examples*

Chemistry of Fire

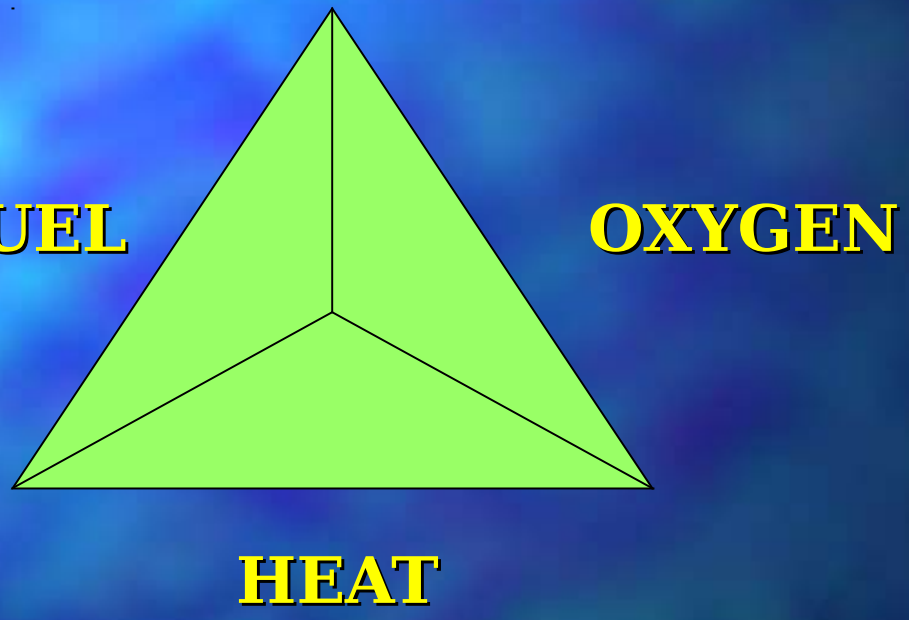
- Oxygen:
  - Normal Air
    - *21%*
  - Unconsciousness
    - *18%*
  - Flame
    - *15%*
  - Smolder
    - *3%*

Chemistry of Fire

- Heat:
  - From where?
    - *Sparks*
    - *Short circuits*
    - *Matches*
    - *Friction*

Chemistry of Fire

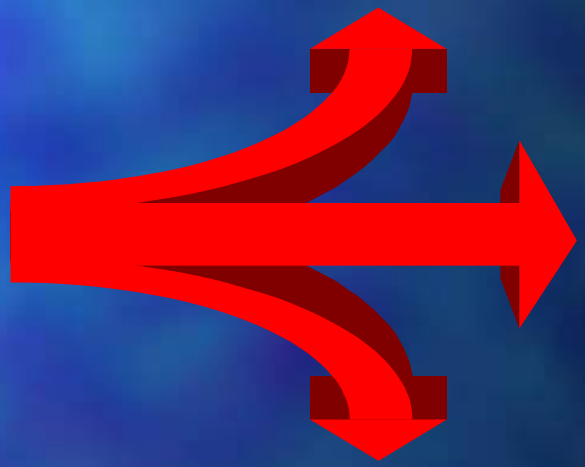
- Fire Tetrahedron:



Uninhibited Chain Reaction

Chemistry of Fire

- Heat Transfer:
  - 3 methods:
    - *Conduction*
    - *Convection*
    - *Radiation*



Chemistry of Fire

- Classifications of Fires:
  - Class “A” *(Alpha)*
  - Class “B” *(Bravo)*
  - Class “C” *(Charlie)*
  - Class “D” *(Delta)*

Chemistry of Fire

- Class “A” Fire:
  - Characteristics:
    - *Leaves an ash*
  - Examples:
    - *wood*
    - *paper*
    - *people*
  - Extinguishing Agents:
    - *water*

Chemistry of Fire

- Class “B” Fire:
  - Characteristics:
    - *flammable liquids*
  - Examples:
    - *gasoline*
    - *oil*
    - *paint*
  - Extinguishing Agents:
    - *AFFF*
    - *PKP (if small)*
    - *Lid*

Chemistry of Fire

- Class “C” Fire:
  - Characteristics:
    - *energized electrical fire*
  - Examples:
    - *motors*
    - *cables*
    - *lighting*
  - Extinguishing Agents:

    De-energize first
    - *carbon dioxide (CO_2)*
    - *PKP as last resort (corrosive)*

Chemistry of Fire

- Class “D” Fire:
  - Characteristics:
    - *combustible metals*
    - *special fires*
  - Examples:
    - *Aircraft wheels*
    - *Weapons (missiles, flares)*
  - Extinguishing Agents:
    - *large amounts of water*
    - *jettison*
    - *sand*

End of Chemistry Lesson